

## REMARKS

The Office Action of July 11, 2002, has been carefully considered.

It is noted that claims 11, 12, 15 and 20 are rejected under 35 USC 102(b) over the patent to Fujiwara, et al.

It is further noted that claims 13, 14, 16-19, 21 and 22 would be allowable if rewritten in independent form.

In view of the Examiner's rejection of the claims applicant has amended claims 11, 13, 14, 16, 19 and 21.

Claims 13, 14, 16, 19 and 21 have been amended so that they are now in independent form. With the Examiner's indication that these claims would be allowable if rewritten in independent form it is respectfully submitted that claims 13, 14, 16, 19 and 21, as well as dependent claims 17, 18 and 22 are now in allowable condition.

It is respectfully submitted that the remaining claims differ essentially and in an unobvious, highly advantageous manner from the constructions disclosed in the reference.

Turning now to the reference, it can be seen that Fujiwara, et al. disclose a digital displacement sensor with zig zag coils. The Examiner refers to the stationary element 5 of Fujiwara, et al. as a housing. Applicant respectfully submits that this element has nothing in common with the housing recited in the presently claimed invention and as described in the specification. Furthermore, Fujiwara, et al. do not disclose a return line having a width in areas permeated by large amounts of flux that is proportional to an expected output value associated with a desired position value, as in the presently claimed invention. Furthermore, the presently

claimed invention produces an analog output signal whereas Fujiwara, et al. produce a digital output signal.

Furthermore, Fujiwara, et al. do not disclose a reference loop as recited in the presently claimed invention. In Fujiwara, et al. a separate reference loop would be necessary at each right angle loop. This is quite contrary to the teachings of the presently claimed invention.

In summary, it is respectfully submitted that Fujiwara, et al. do not disclose an inductive sensor having a return line with a width in areas permeated by a large amounts of flux that is proportional to an expected output value associated with a desired position value, thereby producing an analog output signal, as in the presently claimed invention.

In view of these considerations it is respectfully submitted that the rejection of claims 11, 12, 15 and 20 under 35 USC 102(a) over the above-discussed reference is overcome and should be withdrawn.

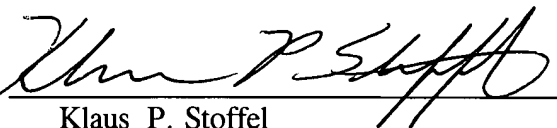
Reconsideration and allowance of the present application are respectfully requested.

A Credit Card Payment Form in the amount of \$120 is enclosed in payment for the addition of new claims for a small entity (three independent claims).

It is believed that no fees or charges are required at this time in connection with the present application; however, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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Dated: November 12, 2002

In the Claims:

11. (Amended) An inductive sensor, comprising:

a fixed housing;

a body moveable on said fixed housing, said body having an inductive transmission element operative for generating an alternating magnetic field flux during movement of said body said flux passing over a flux path area of said fixed housing; and

at least one conductor loop arranged on the fixed housing so as to extend along a measurement length of said housing, said conductor loop including a feed line extending along the measurement length and a return line, said return line having a path which at regular intervals of said measurement length alternates into and out of said flux path area, a permeation of said return line at a given path location by the flux of said flux region inducing a loop output voltage indicative of a measurement length position of said body on said fixed housing, the return line having a width in areas permeated by large amounts of flux that is proportional to an expected output value associated with a desired position value, thereby producing an analog output signal.

13. (Amended) An inductive sensor, [according to claim 11, further] comprising:

a fixed housing;

a body moveable on said fixed housing, said body having an inductive transmission element operative for generating an alternating magnetic field flux during movement of said body said flux passing over a flux path area of said fixed housing;

at least one conductor loop arranged on the fixed housing so as to extend along a measurement length of said housing, said conductor loop including a feed line extending along the measurement length and a return line, said return line having a path which at regular intervals of said measurement length alternates into and out of said flux path area, a permeation of said return line at a given path location by the flux of said flux region inducing a loop output voltage indicative of a measurement length position of said body on said fixed housing; and

another conductor loop arranged on said fixed housing, said other conductor loop including a second feed line and a second return line, said second return line having a path which at regular intervals of said measurement length which are offset from the intervals of said one conductor loop alternates into and out of said flux path area, said other loop inducing a loop output voltage additive to the output voltage of said one conductor loop for indicating a measurement length position of said body on said fixed housing.

14. (Amended) An inductive sensor, [according to claim 11, further] comprising:

a fixed housing;

a body moveable on said fixed housing, said body having an inductive transmission element operative for generating an alternating magnetic field flux during movement of said body said flux passing over a flux path area of said fixed housing;

at least one conductor loop arranged on the fixed housing so as to extend along a measurement length of said housing, said conductor loop including a feed line extending along the measurement length and a return line, said return line having a path which at regular intervals of said measurement length alternates into and out of said flux path area, a permeation of said return

line at a given path location by the flux of said flux region inducing a loop output voltage indicative of a measurement length position of said body on said fixed housing; and

another conductor loop arranged on said fixed housing, said other conductor loop including a second feed line and a second return line, said second return line being arranged at a fixed housing side opposite a housing side at which said one conductor loop return line is arranged, said second return line at regular intervals of said measurement length which are offset from the intervals of said one conductor loop alternating into and out of said flux path area, said other loop inducing another loop output voltage, a difference between said other loop output voltage and the voltage induced in said one conductor loop indicating a measurement length position of said body on the housing.

16. (Amended) An inductive sensor [according to claim 11, wherein],  
comprising:

a fixed housing;

a body moveable on said fixed housing, said body having an inductive transmission element operative for generating an alternating magnetic field flux during movement of said body said flux passing over a flux path area of said fixed housing; and

at least one conductor loop arranged on the fixed housing so as to extend along a measurement length of said housing, said conductor loop including a feed line extending along the measurement length and a return line, said return line having a path which at regular intervals of said measurement length alternates into and out of said flux path area, a permeation of said return line at a given path location by the flux of said flux region inducing a loop output voltage indicative of a measurement length position of said body on said fixed housing, said return

line path [alternates] alternating into and out of said flux path area at locations spaced one from another at a uniform pitch along said measurement length, said inductive transmission element having a measuring core of high permeability material, said core having an air gap, a width of the air gap in a direction of said measurement length corresponding to said pitch.

19. (Amended) An inductive sensor [according to claim 11, wherein],  
comprising:

a fixed housing;

a body moveable on said fixed housing, said body having an inductive transmission element operative for generating an alternating magnetic field flux during movement of said body said flux passing over a flux path area of said fixed housing; and

at least one conductor loop arranged on the fixed housing so as to extend along a measurement length of said housing, said conductor loop including a feed line extending along the measurement length and a return line, said return line having a path which at regular intervals of said measurement length alternates into and out of said flux path area, a permeation of said return line at a given path location by the flux of said flux region inducing a loop output voltage indicative of a measurement length position of said body on said fixed housing, said return line path [alternates] alternating into and out of said flux path area at locations paced one from another at a uniform pitch along said measurement length, said inductive transmission element having a measuring core of high permeability material, said core having an air gap, an average of an induction over a width of said conductor along a line perpendicular to a measurement length direction during a movement of the measuring core rising and falling in an approximately linear form over a distance equal to said pitch.

21. (Amended) An inductive sensor, [according to claim 20, further] comprising:

a fixed housing;

a body moveable on said fixed housing, said body having an inductive transmission element operative for generating an alternating magnetic field flux during movement of said body said flux passing over a flux path area of said fixed housing;

at least one conductor loop arranged on the fixed housing so as to extend along a measurement length of said housing, said conductor loop including a feed line extending along the measurement length and a return line, said return line having a path which at regular intervals of said measurement length alternates into and out of said flux path area, a permeation of said return line at a given path location by the flux of said flux region inducing a loop output voltage indicative of a measurement length position of said body on said fixed housing, said measurement length is circular, said conductor loop being arranged on said housing in a circular course, said transmission element being mounted for rotation about said conductor loop for measuring an angular position of the body on said measurement length; and

another conductor loop arranged on said fixed housing in a circular course, said one and said other conductor loops each extending over an angle of 360 degrees, said other conductor loop including a second feed line and a second return line, said second return line having a path which at [regulars] regular intervals of said measurement length alternates into and out of said flux path area, said other loop inducing another loop voltage, a ratio of said one



conductor loop voltage over said other loop conductor voltage being indicative of a body angular position on said fixed housing.